

8th Grade Math Curriculum

Eighth-grade math covers algebra concepts, laying the groundwork for high school studies in both *Geometry* and *Algebra 2*. You can use this eighth-grade math curriculum as either your main homeschool program or as a supplement to another homeschool curriculum or a traditional school. The following information will explain the steps you should take to meet your child's 8th grade math goals.

What Math Should an 8th Grader Already Know?

An eighth-grade math curriculum covers more than just basic arithmetic. It dives into several different mathematical areas that are crucial for comprehensive learning. Key topics include number sense and operations, solving equations with one and two variables, polynomials, quadratics, geometric transformations, 3D geometric analysis, metric and standard measurement, theoretical and experimental probability.

Mastering these skills is important to help your student succeed in high school by building upon prior knowledge. Here are the topics that eighth graders should already be familiar with:

1. Representing numbers in word, standard, expanded, and scientific notation
2. Understanding and applying ratios and rates
3. Performing multiplication and division with positive and negative rational numbers
4. Solving and graphing single-variable linear inequalities
5. Determining the perimeter and area of two-dimensional shapes
6. Plotting ordered pairs in all four quadrants
7. Computing experimental & theoretical probabilities
8. Calculating depending and independent probability events

If your student needs to revisit seventh-grade math concepts, our curriculum offers flexible grade-level options, allowing access to lessons in the seventh grade.

What Do 8th Graders Learn in Math?

The major math concepts covered for an eighth-grade curriculum are:

- Algebra: Equations
- Algebra: Inequalities
- Algebra: Graphing
- Algebra: Polynomials
- Algebra: Quadratics
- Geometry: Transformations
- Geometry: Plane Geometry
- Geometry: Surface Area & Volume
- Geometry: Right Angle Triangles
- Data Analysis & Statistics

8th Grade Math Goals and Objectives

By the end of the year, your eighth grader will be able to do the following:

1. Recognize and explain rational and irrational numbers
2. Identify and execute transformations of shapes on a coordinate plane
3. Solve and graph systems of linear equations with two variables
4. Graph quadratic equations and identify solutions
5. Define and distinguish between various sampling techniques
6. Calculate statistical measures of real-world data

Special Note Regarding 7th & 8th Grade Math Schedules

We recommend taking two years to complete both a full year-long Algebra course (which also includes pre-Algebra) and a middle school Geometry course.

Start by covering the first half of Algebra (begin with pre-Algebra) and then move into the first half of Geometry during the 7th grade year. You will cover the second halves of both Algebra and Geometry during the 8th grade year, so by the time students finish their 8th grade year, they will have completed both Algebra 1 and middle school level Geometry, and be ready for either Algebra 2 or High School Geometry (whichever is offered for the 9th grade year for their school).

- 7th Grade covers Algebra Sessions 1-4; Geometry: Sessions 1-6; Probability
- 8th Grade covers Algebra Sessions 5-7; Geometry: Sessions 7-10; Statistics
- You may do Algebra all in one year by going through all sessions of Unit 4: Algebra
- Please complete Algebra up through Session #4 (Graphing) before starting Geometry

7TH AND 8TH GRADE STUDY SCHEDULE

This is an example of the two-year schedule that covers the first half of both Algebra 1 (with pre-Algebra) and Geometry along with a course in Probability in the 7th Grade year; the second halves of both Algebra 1 and Geometry along with a course in Statistics in the 8th Grade year.

Grade 7: Pre-Algebra, Algebra 1, Geometry & Probability

September Unit 4: Algebra #1 <i>(Pre-Algebra) Operations on Integers</i>	October Unit #4: Algebra #1 <i>(Pre-Algebra) Variables, Terms & Expressions</i>	November Unit 4: Algebra #2 <i>Multi-Step Equations</i>	December <i>Algebra Review</i>
January Unit 4: Algebra #3 <i>Inequalities</i>	February Unit 5: Geometry #1 & 2 <i>Shapes, Lines & Angles</i>	March Unit 5: Geometry #3-6 <i>Plane Geometry</i>	April Unit 4: Algebra #4 <i>Graphing</i>
May Probability <i>Mini Math Course</i>	June Math Camp	July	August 8 th Grade Review (Partial)

Grade 8: Algebra 1, Geometry & Statistics

September Unit 4: Algebra #2-4 <i>Review of Multi-Step Equations, Inequalities & Graphing</i>	October Unit 4: Algebra #5 <i>Linear Systems of Equations</i>	November Unit 4: Algebra #6 <i>Polynomials</i>	December <i>Algebra Review</i>
January Unit 4: Algebra #7 <i>Quadratic Equations</i>	February Unit 4: Algebra #7 <i>Quadratic Equations</i> Unit 5: Geometry #1 <i>Transformations</i>	March Unit 5: Geometry #7-8 <i>3D Geometry: Surface Area & Volume</i>	April Unit 5: Geometry #9-10 <i>Trigonometry Essentials</i> <i>Mini Math Course</i>
May Statistics <i>Mini Math Course</i>	June Math Camp	July	August 8 th Grade Review (Full)

8th Grade Math Lesson Plan – 36 Weeks

Fall Term (Sept-Dec)

- Week 1: Solving One-Step Equations (Algebra Workbook #3 Pages 1-8)
- Week 2: Solving Two-Step Equations (Algebra Workbook #3 Pages 9-23)
- Week 3: Graphing Slope-Intercept Form (Algebra Workbook #5: Pages 17-29)
- Week 4: Solving Inequalities with Absolute Value (Algebra Workbook #4 Pages 17-26)
- Week 5: Graphing Inequalities (Algebra Workbook #5: Pages 30-36)
- Week 6: Systems of Linear Equations (Algebra Workbook #6: Pages 1-8)
- Week 7: Solving with Elimination (Algebra Workbook #6: Pages 9-13)
- Week 8: Solving with Substitution (Algebra Workbook #6: Pages 14-28)
- Week 9: Solving Systems of Inequalities (Algebra Workbook #6: Pages 29-35)
- Week 10: Introducing Polynomials (Algebra Workbook #7: Pages 1-12)
- Week 11: Factoring Polynomials (Algebra Workbook #7: Pages 13-24)
- Week 12: Polynomial Multiplication (Algebra Workbook #7: Pages 25-31)
- Week 13: Polynomial Standard Form (Algebra Workbook #7: Pages 32-37)
- Week 14: Algebra Review

Winter Term (Jan-March)

- Week 15: Quadratics (Algebra Workbook #8: Pages 1-16)
- Week 16: Quadratics: Square Roots (Algebra Workbook #8: Pages 17-26)
- Week 17: Quadratic Formula (Algebra Workbook #8: Pages 27-31)
- Week 18: Graphing Quadratic Functions (Algebra Workbook #8: Pages 32-34)
- Week 19: Graphing Quadratic Functions (Algebra Workbook #8: Pages 35-38)
- Week 20: Algebra Review
- Week 21: Geometry Transformations Part 1
- Week 22: Geometry Transformations Part 2
- Week 23: Rectangular Prisms (Geometry Workbook #4: Pages 1-6)
- Week 24: Triangular Prisms (Geometry Workbook #4: Pages 7-11)
- Week 25: Prism & Pyramid Volume (Geometry Workbook #4: Pages 12-13)
- Week 26: Cylinder, Cone & Sphere Volume (Geometry Workbook #4: Pages 14-19)
- Week 27: Geometry Review

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Spring Term (April-May)

- Week 28: Trigonometry 1: Angles and Triangles (Geometry Workbook #5: Pages 1-15)
- Week 29: Trigonometry 2: Sin, Cos Functions (Geometry Workbook #5: Pages 16-21)
- Week 30: Trigonometry 3: Tangent Function
- Week 31: Trigonometry 4: Applications
- Week 32: Data and Statistics (Mean, Median, Measures of Center)
- Week 33: Data and Statistics & Review (Range, IQR, and MAD)
- Week 34: Data and Statistics (Dot Plots & Histograms)
- Week 35: Data and Statistics (Box Plots & Statistics Applications)
- Week 36: Review

Summer Term (June-Aug)

- 10-session Review of all Middle School Content for Graduating 8th Graders!

Completing Algebra 1 in ONE YEAR (instead of two)

The following is for students who are doing a complete Algebra 1 course in one year, starting with pre-Algebra. If you go this route, you will only study algebra so the following year will include a full year of geometry and must also include probability, data and statistics studies.

NOTE: Unit 5 Geometry requires Algebra, so you must complete at least up through Unit 4 Algebra: Session 4 (Graphing) before starting Unit 5: Geometry.

STUDY SCHEDULE: FULL ALGEBRA 1 COURSE

This is an example of the schedule that covers a full year of only Algebra 1 (with pre-Algebra).

September Unit 4: Algebra #1 <i>(Pre-Algebra)</i> <i>Operations on Integers</i>	October Unit #4: Algebra #1 <i>(Pre-Algebra) Variables,</i> <i>Terms & Expressions</i>	November Unit 4: Algebra #2 <i>Multi-Step Equations</i>	December <i>Algebra Review</i>
January Unit 4: Algebra #3 <i>Rational Numbers &</i> <i>Inequalities</i>	February Unit 4: Algebra #4 <i>Graphing</i>	March Unit 4: Algebra #5 <i>Systems of Linear</i> <i>Equations</i>	April Unit 4: Algebra #6 <i>Polynomials</i>
May Unit 4: Algebra #7: <i>Quadratics</i>	June Math Camp	July	August Review before starting next level

Algebra 1 Math Lesson Plan – 36 Weeks

Fall Term (Sept - Dec)

- Week 1: Prime Factorization (Algebra Workbook #1 Pages 1-6)
- Week 2: Number Line, Positive & Negative Numbers (Algebra Workbook #1 Pages 7-23)
- Week 3: Operations on Integers (Algebra Workbook #1 Pages 24-37)
- Week 4: Exponents (Algebra Workbook #2 Pages 1-11)
- Week 5: Equivalent Expressions (Algebra Workbook #2 Pages 12-17)
- Week 6: Like & Unlike Terms (Algebra Workbook #2 Pages 17-25)
- Week 7: Order of Operations (Algebra Workbook #2 Pages 26-36)
- Week 8: Algebra Review
- Week 9: Solving One-Step Equations (Algebra Workbook #3 Pages 1-8)
- Week 10: Solving Two-Step Equations (Algebra Workbook #3 Pages 9-16)
- Week 11: Solving Two-Step Equations (Algebra Workbook #3 Pages 17-23)
- Week 12: Word Problems (Algebra Workbook #3 Pages 24-37)
- Week 13: Algebra Review

Winter/Spring Term (Jan - May)

- Week 14: Rational Numbers & Number Lines (Algebra Workbook #4 Pages 1-11)
- Week 15: Inequalities & Absolute Value (Algebra Workbook #4 Pages 12-16)
- Week 16: Solving Inequalities with Absolute Value (Algebra Workbook #4 Pages 17-26)
- Week 17: Relations & Functions & Review (Algebra Workbook #4 Pages 27-37)
- Week 18: Coordinate Points (Algebra Workbook #5: Pages 1-8)
- Week 19: Linear Equations (Algebra Workbook #5: Pages 9-16)
- Week 20: Slope-Intercept Form (Algebra Workbook #5: Pages 17-29)
- Week 21: Graphing Inequalities (Algebra Workbook #5: Pages 30-36)
- Week 22: Algebra Review
- Week 23: Systems of Linear Equations (Algebra Workbook #6: Pages 1-8)
- Week 24: Solving with Elimination (Algebra Workbook #6: Pages 9-13)
- Week 25: Solving with Substitution (Algebra Workbook #6: Pages 14-28)
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- Week 28: Factoring Polynomials (Algebra Workbook #7: Pages 13-24)
- Week 29: Polynomial Multiplication (Algebra Workbook #7: Pages 25-31)
- Week 30: Polynomial Standard Form (Algebra Workbook #7: Pages 32-37)
- Week 31: Quadratics (Algebra Workbook #8: Pages 1-16)
- Week 32: Quadratics: Square Roots (Algebra Workbook #8: Pages 17-26)
- Week 33: Quadratic Formula (Algebra Workbook #8: Pages 27-31)
- Week 34: Graphing Quadratic Functions (Algebra Workbook #8: Pages 32-34)
- Week 35: Graphing Quadratic Functions (Algebra Workbook #8: Pages 35-38)
- Week 36: Algebra Review

Completing Geometry in ONE YEAR (instead of two)

The following is for students who wish to study a complete Geometry course in one year.

NOTE: Unit 5 Geometry requires Algebra, so you must complete at least up through Unit 4 Algebra: Session 4 (Graphing) before starting Unit 5: Geometry.

STUDY SCHEDULE: FULL GEOMETRY COURSE

This is an example of the schedule that covers a full year of Geometry (prerequisite: Algebra 1).

September Unit 5: Geometry #1 <i>Shapes & Constructions</i>	October Unit #5: Geometry #2 <i>Angles</i>	November Unit 5: Geometry #3 <i>Triangles</i>	December Unit 5: Geometry #4 <i>Circles</i>
January Unit 5: Geometry #5 <i>Plane Geometry</i>	February Unit 5: Geometry #6 <i>Similarity</i>	March Unit 5: Geometry #7 <i>Surface Area</i>	April Unit 5: Geometry #8 <i>Volume</i>
May Unit 5: #9 & 10: <i>Right Angle Geometry (Trigonometry Essentials)</i>	June Probability	July Statistics	August Full Upper Level Review (Algebra 1 & Geometry)